

I. MONITORING AND COMMUNICATION

I.1 INTRODUCTION

The following is the proposed monitoring and communications plan (MCP) for the Vegetation Treatment Program (VTP). The goals of the MCP are to track Program implementation and effectiveness, implement informal types of adaptive management, and to provide a mechanism for communication with affected entities and stakeholders. Additionally, the public will be provided an opportunity to participate in project scoping for certain types of projects. The MCP includes the following basic components:

- A mechanism for introducing independent science into the VTP;
- A requirement to geospatially track project implementation over time;
- Implementation monitoring to provide a rapid feedback loop for corrective action at the project scale;
- Qualitative project effectiveness monitoring to communicate “lessons learned” during VTP implementation;
- Post-incident effectiveness monitoring;
- An annual workshop in each CAL FIRE Region to communicate Program implementation, effectiveness, and “lessons learned” to stakeholders;
- A process that will allow for stakeholder involvement in scoping for non-WUI related projects in southern California; and
- A goal to implement “active” adaptive management by securing dedicated funding for research effectiveness and validation monitoring.

Due to lack of resources the more rigorous “active” adaptive management program cannot be implemented at this time. However, components of the MCP will allow for informal adaptive management under the VTP in addition to a venue for stakeholder involvement. These components should be seen as the initial foundation for a more comprehensive adaptive management program once funding is secured.

I.1.1 CONCEPTUAL FRAMEWORK

Adaptive management can vary along a spectrum from the informal “trial-and-error learning” to “passive” adaptive management, all the way to formal “active” adaptive management. The options selected will vary based upon the level of uncertainty with expected management outcomes and the risk the management action poses to the resource(s) of concern (Lee, 2004; Gregory et al., 2006). Trial-and-error learning places emphasis on project implementation and solving or mitigating particularly narrow problems with management actions (e.g., adequacy of BMP implementation) (Wilhere, 2002; Lee, 2004). This type of learning is often anecdotal and replicated, but is useful for managers when applied appropriately. Passive adaptive management is when

existing information is used to guide decision-making, and outcomes are monitored with the intent that management actions are changed in response to the monitored data, and that data is continually updated through monitoring (Gregory et al., 2006). Active adaptive management is where management actions are treated as experimental manipulations where competing hypotheses regarding the effect of management actions on resources of concern are rigorously tested (Gregory, et al., 2006).

Trial-and-error learning is most appropriate when the range of management outcomes are narrow, risk to the resource(s) of concern is low, and when the knowledge and experience of the practitioner is high. Passive adaptive management is a good option when there is high confidence in resource response and where there is already existing data on the resource of concern. However, passive adaptive management often results in slower learning without clear implications for management (Gregory et al., 2006). Theoretically, active adaptive management results in more statistically robust information in a shorter time frame. However, it requires more cost to implement, and can be cost prohibitive for some management entities.

While an inclusive and structured decision-making process is necessary for successful adaptive management, monitoring will be the means for measuring outcomes related to VTP implementation and effectiveness. Ideally a hierarchical approach to monitoring is needed; where monitoring is nested so that multiple objectives can be addressed in an integrated fashion (Ralph and Poole, 2003). There is inconsistency in monitoring method terminology. Hence, it is better to describe the general purpose for each type of monitoring. Resource monitoring is generally broken into the following categories:

- **Baseline and Trend Monitoring** – Baseline monitoring characterizes existing conditions. If the monitoring is continued at regular intervals over time it can be used to determine trends (i.e., trend monitoring). This type of monitoring will generally be long-term in nature.
- **Effectiveness Monitoring** – Effectiveness monitoring determines whether a particular action or set of actions had the desired outcome. Effectiveness monitoring can be applied to individual management practices or to suites of actions across the landscape. Larger scale effectiveness monitoring might also be referred to as Project or Program monitoring. Effectiveness monitoring can be either qualitative or quantitative. Quantitative effectiveness monitoring is typically slower and more complex than implementation monitoring, and should employ a robust statistical design for hypothesis testing.
- **Validation Monitoring** – Validation monitoring has multiple definitions. For the purposes of this proposal, validation monitoring refers to monitoring that verifies or refutes our assumptions regarding the underlying linkages between cause and effect. It answers not only whether we achieved a desired outcome, but why. Validation monitoring can be considered a more rigorous form of effectiveness

monitoring and is often done in a research setting. Validation monitoring is typically the slowest form of adaptive management and should employ a robust statistical design for hypothesis testing.

Given this background, the VTP seeks to implement less formal types of adaptive management to aid in Program implementation and to help assess Program effectiveness. Implementing informal adaptive management will be a required element of the VTP until funding can be secured to employ the more rigorous active adaptive management. The communications component will provide more transparency during Program decision-making and will help aid the dissemination of new science and monitoring results.

I.2 REQUIRED MONITORING AND LEARNING COMPONENTS

I.2.1 A PROCESS FOR INTRODUCING INDEPENDENT SCIENCE INTO THE VTP

This process will provide a pathway for independent science to increase learning and potentially modify practices performed under the VTP. Independent science will generally not identify clear pathways forward, but it may provide useful information that can be incorporated into the VTP. Relevancy for the Program can be determined by Department staff, along with input from stakeholders and the research community. In order to facilitate trust, this process of introducing science is best led by a group or other appropriate independent scientific research entity.

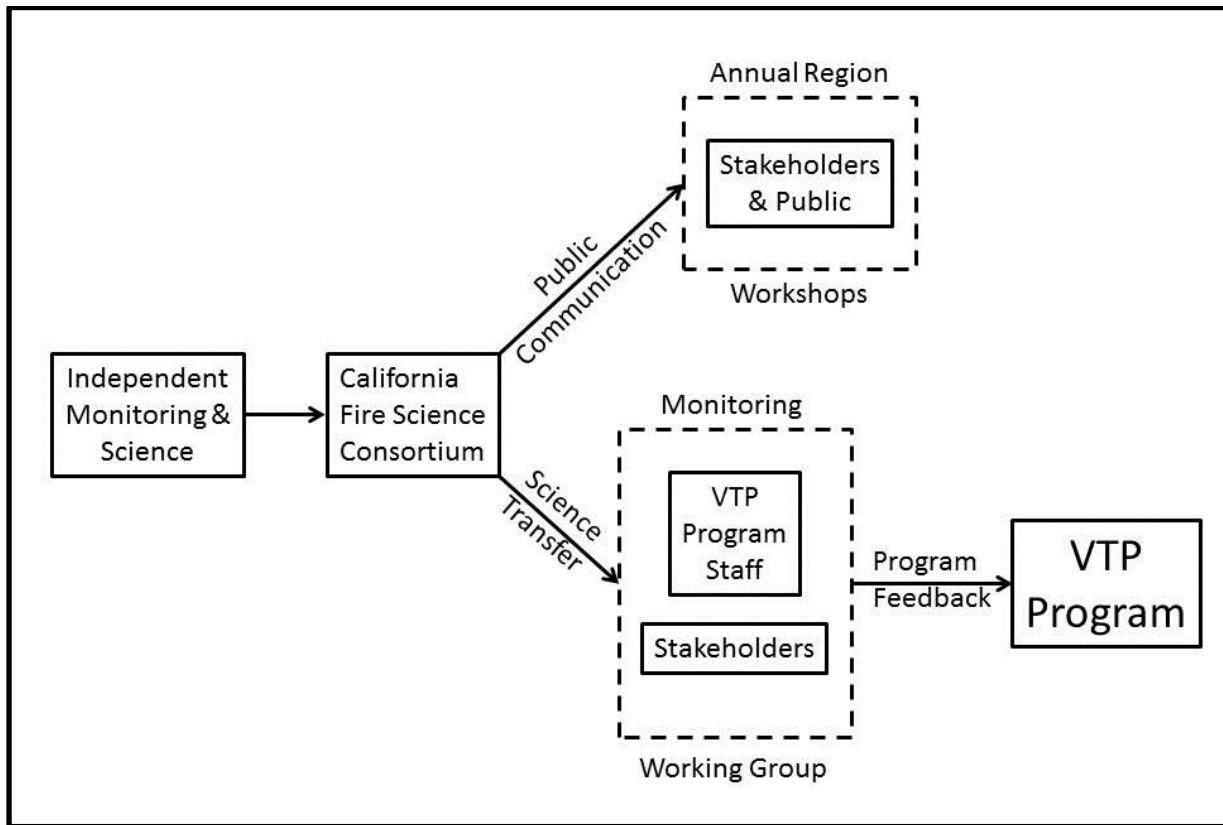


Figure I.2-1 A flowchart showing how independent science and monitoring relevant for the VTP is communicated to the public and is used to improve Program decision-making.

I.2.2 PROGRAM TREND MONITORING

Program trend monitoring requirements would include accounting for all VTP projects over time and space. This will allow us to determine how much of the landscape is treated over a given planning horizon, and where these treatments are located spatially. This data is also essential for effectiveness monitoring at the project and program scales. This data would need to be collected and compiled by VMP foresters and program managers, and entered into a geodatabase that is managed by the Fire Resource Assessment Program (FRAP) (Figure 2). This will provide a geospatial means to track program implementation over time and space, and communicate this information to the BOF and public stakeholders (Figure 3). Eventually, program trend monitoring, along with geospatial incident tracking, will provide the spatial database necessary for evaluating VTP effectiveness at the landscape scale (see Syphard et al., 2011).

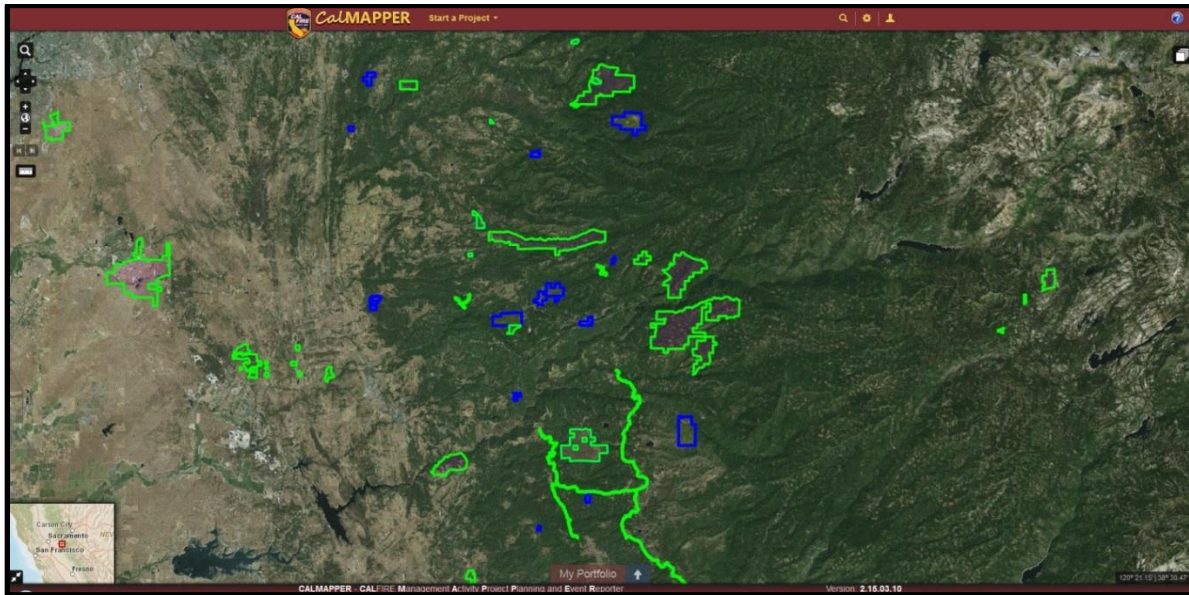


Figure I.2-2 The CalMAPPER web-based portal is an example of a geodatabase that can be used to track Program implementation and effectiveness over time and space.

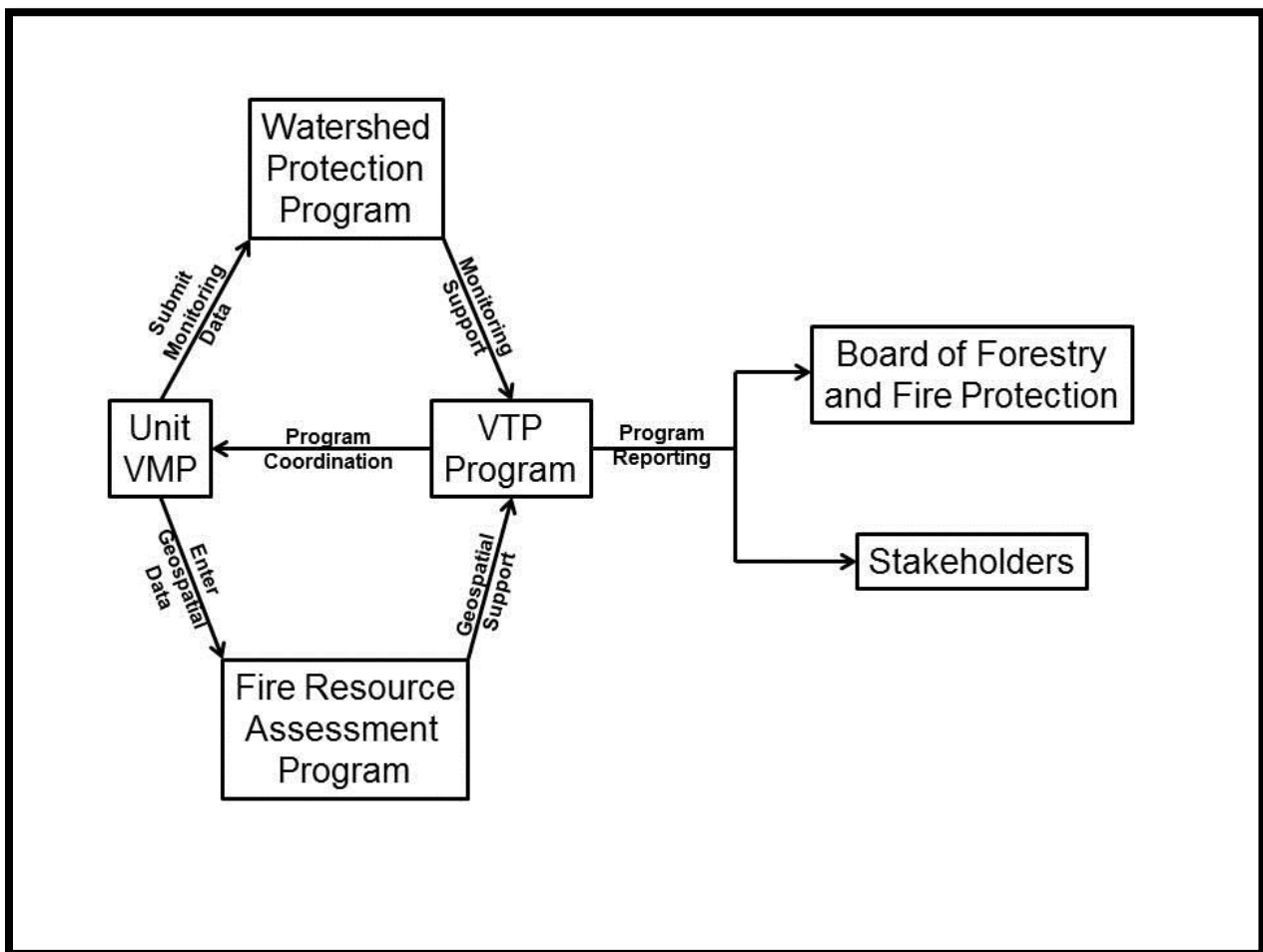


Figure I.2-3 A flowchart demonstrating how project and Program data is tracked and communicated to the BOF and to public stakeholders.

I.2.3 IMPLEMENTATION MONITORING

This type of monitoring determines whether management actions were carried out as planned. For example, were all the Standard Project Requirements and Project Specific Requirements (i.e., BMPs) implemented as specified in the project documents? Implementation monitoring is crucial for rapid corrective action. Qualitative implementation monitoring uses CAL FIRE VMP staff to determine if projects are implemented correctly. This monitoring component will add a systematic element to something that VMP foresters are already doing (i.e., administering projects for proper implementation). The VTP requires the use of an implementation checklist (Attachment A) so that there is a systematic methodology for implementation monitoring. This method is cost-effective, and produces real-time corrective actions that can reduce ecological risk, and can provide accountability to stakeholders and the public.

I.2.4 PHOTO-POINT EFFECTIVENESS MONITORING

Effectiveness monitoring determines whether a particular action or set of action had the desired outcome. Photo-point monitoring consists of repeat photography of the area of interest. Sequential photographs are taken from the same location and with the same field of view as the initial photograph. By taking photos at fixed photo-points the effectiveness of vegetation treatments can be visually demonstrated. The pre- and post-treatment photos can also be compared to photographic representations of the 13 standard fire behavior models (Anderson 1982), with treatment effectiveness being evaluated on how the treatment would affect the rate of spread and flame length (Scott and Burgan, 2005).

Photo-point monitoring is a standardized procedure for documenting rates of change, and is an effective communication tool for education and public outreach. **All projects under the VTP will require at least two pre- and post-treatment photos for each activity type (e.g., prescribed fire, mechanical etc.) in the project.** Also, project coordinators are encouraged to photograph other project elements, such as PSRs around associated with sensitive resource areas (e.g., habitat retention areas, etc). Standardized procedures for photo-point monitoring are outlined in Attachment B of the Monitoring and Communications Plan.

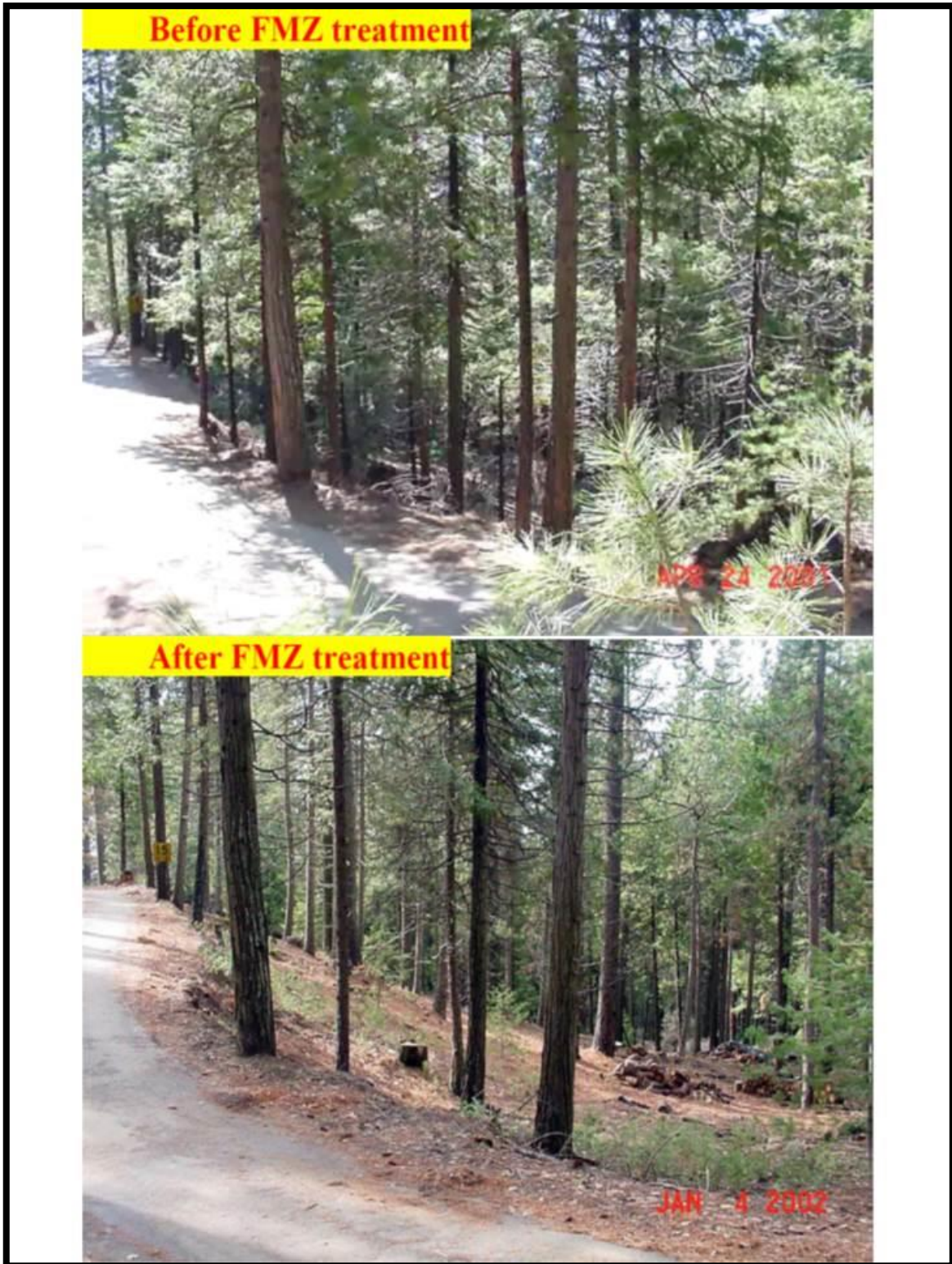


Figure I.2-4 Photo-point sequence showing pre- and post-treatment in a fuel modification zone (FMZ).

I.2.5 POST-INCIDENT EFFECTIVENESS MONITORING

The VTP will require the use of post-incident reporting to assess the effectiveness of treated areas during fire suppression activities.

Option 1: An additional element of reporting will be added to the post incident action summary (PIAS) to detail if and how existing fuel treatments are used in fire suppression activities.

Option 2: Unit VMP Foresters and Pre-Fire Engineers (PFEs) will report to VTP administrators when fuels treatments are used in fire suppression activities.

A subset of these incidents will be explored as more detailed case studies to document how the treated areas are utilized tactically (Figure 5). In turn, this information can be used to improve fuel treatment design to optimize tactical effectiveness. A template for more detailed post-incident effectiveness monitoring is included as Attachment C.

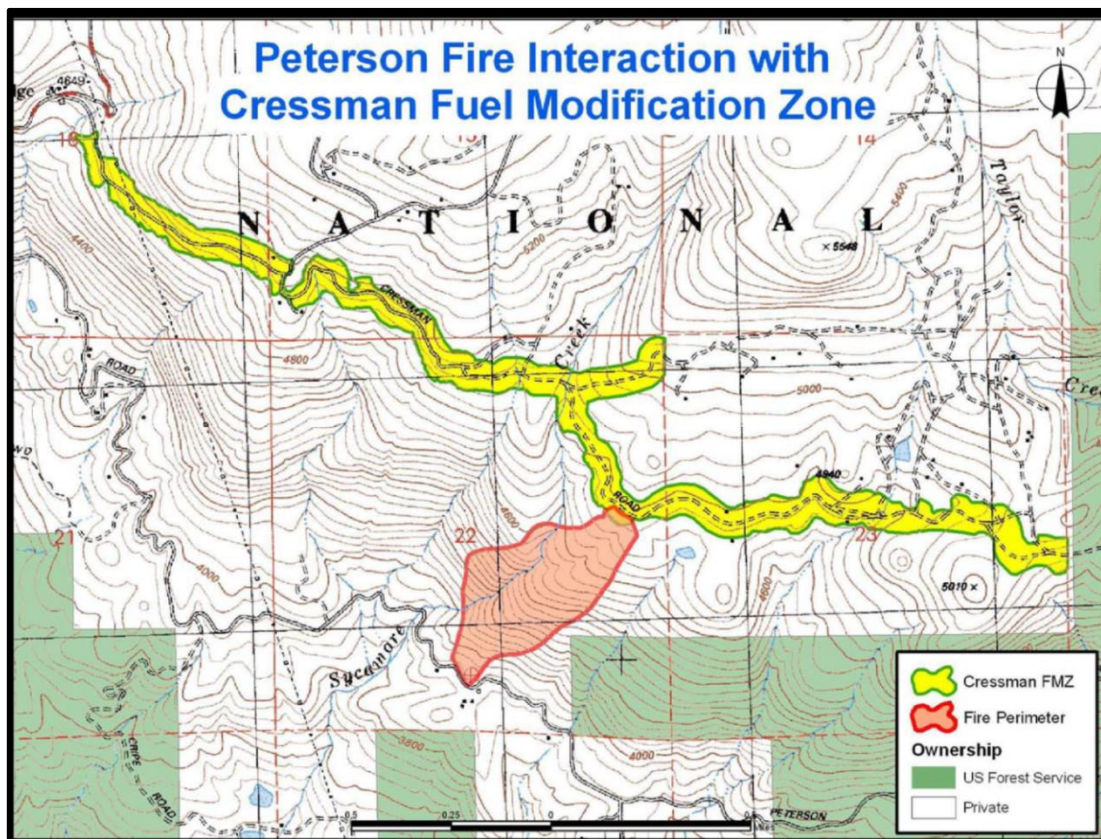


Figure I.2-5 A picture demonstrating the interaction of the Peterson Fire (July 12, 2004) with the Cressman Fuel Modification Zone (FMZ). Battalion Chief Jim Smith noted firefighters were able to attack the head of the fire once it reached the FMZ. Also, firefighters were able to anchor-in at the FMZ and safely make a downhill hoselay along the flank of the fire. The report on the Peterson Fire – Cressman Fuel Modification Zone will be used as a template for post-incident effectiveness monitoring (Attachment C)

I.3 FUTURE MONITORING COMPONENTS

Rigorous Effectiveness and Validation Monitoring

A goal of the VTP is to secure funding for more rigorous types of effectiveness and validation monitoring. This type of monitoring involves structuring selected projects as experiments to statistically test hypotheses regarding treatment effectiveness in achieving a desired outcome. Due to the high cost of implementing this type of monitoring, the VTP is unable to commit to this monitoring upon VTP PEIR approval. However, a multi-stakeholder VTP Monitoring Working Group will be established to develop a process to fund and implement monitoring and/or research to improve VTP implementation and effectiveness.

Rigorous types of monitoring will allow for the implementation of more formal active adaptive management, and greater certainty in decision-making. For example, fuelbreaks in chaparral can be subject to invasion by exotic plant species. Through rigorous effectiveness monitoring, several treatments (including controls) would be monitored for invasive plant growth. The treatments are then statistically compared to determine which one is most effective in preventing invasive plant growth. Validation monitoring takes this one step further by illuminating the causal processes responsible for treatment effectiveness. This allows us greater understanding of why a given treatment works versus another. In turn, this increased understanding can lead to further innovation in project design. Quantitative effectiveness and validation monitoring can be done across a range of scales (i.e., plot scale to scale of the Program area) depending upon the type of monitoring question being answered. A nested, hierarchical design is extremely powerful for answering multiple questions simultaneously in an integrated fashion (Ralph and Poole, 2003).

I.4 REQUIRED COMMUNICATION COMPONENTS

I.4.1 PROJECT IDENTIFICATION

Landowners, stakeholders, local governments, and affected agencies are encouraged to propose fuels reduction projects and/or provide feedback on these projects to CAL FIRE Unit staff during Unit Fire Plan updates. This will provide a local feedback mechanism to account for community needs for wildfire protection and environmental protection. For example, projects with the highest level of advocates in the local community will generally get prioritized highest during the implementation process. Feedback on environmental constraints from local stakeholders will ensure that environmental protections remain robust and that controversial projects will avoided

when possible. The process for this component is outlined in Chapter 2 and in Figure 2.1-4.

I.4.2 PROJECT NOTIFICATION AND PUBLIC MEETINGS IN SOUTHERN CALIFORNIA COUNTIES

For vegetation treatment projects that are not deemed necessary to protect critical infrastructure or forest health in San Diego, Imperial, Riverside, Oranges, Los Angeles, Ventura, Santa Barbara, Kern, and San Bernardino counties, additional steps are required during project scoping. First, a public notice must be circulated locally, describing the proposed project during the project planning phase for projects outside of the WUI. The notification will be used to inform stakeholders and to solicit information on the potential for significant impacts during the project planning phase. Second, a noticed public meeting will be scheduled so that Unit staff and stakeholders can discuss issues of concern regarding the proposed project. The process for this component is outlined in SPR BIO-5 and in Figure 2.1-4.

I.4.3 PROJECT IMPLEMENTATION NOTIFICATION FOR PRESCRIBED BURNS

For all projects utilizing prescribed fire the following steps are required:

- Approximately two weeks prior to commencement of burning operations, post signs along major road ways in the area describing the project, timing and requesting for smoke sensitive persons in the area to contact the CAL FIRE VMP coordinator.
- Approximately two weeks prior to the commencement of operations, publish a public interest notification in a local newspapers describing the project, timing and requesting for smoke sensitive persons in the area to contact the CAL FIRE VMP coordinator.
- Send local county supervisor a notification letter describing the project, its necessity, timing, and summarize the measures being taken to protect the environment and prevent escape.
- Develop list of smoke sensitive persons in the area and contact them prior to burning.
- Post large orange road signs notifying motorists of the prescribed fire operation and possible smoke impacts along all roads leading through the VMP area.
- Engage in traffic control operations if weather conditions does not allow for adequate smoke dispersion.

I.4.4 ANNUAL REGION WORKSHOPS

Annual workshops will be held in the North and South Regions to allow for the dissemination of new science, monitoring results, and “lessons learned” through VTP implementation. The primary goal of these workshops is communication with the public

regarding VTP implementation and effectiveness, as well as progress in the adaptive management process. The workshops will be organized by Region VMP coordinators in conjunction with CAL FIRE's Watershed Protection Program staff.

I.4.5 VTP MONITORING WORKING GROUP

A VTP Monitoring Working Group will be formed to prioritize the types of critical monitoring questions to be answered through more formal types of monitoring. The group will consist of Department staff, researchers, members of the public, and affected agency personnel. Key responsibilities of the group will include:

- Reaching consensus on the key uncertainties affecting fuels reductions treatments in the SRA.
- Framing the key uncertainties as general and specific questions to be addressed through monitoring and research.
- Prioritizing the monitoring and/or research questions so that they can be addressed in a step-wise fashion.
- Developing a process to fund and implement monitoring and/or research to improve VTP implementation and effectiveness.

I.5 ATTACHMENTS

- **Attachment A (I.5.1): VTP Implementation Checklist**
- **Attachment B (I.5.2): VTP Photo-Point Effectiveness Monitoring Protocol and Datasheet**
- **Attachment C (I.5.3): Post-Incident Effectiveness Monitoring Template**
- **(I.5.6): Interaction Report**

I.5.1 VTP IMPLEMENTATION MONITORING CHECKLIST

The following pages include the VTP Implementation Monitoring Checklist.

California Department of Forestry and Fire Protection

VTP Implementation Monitoring Checklist

The purpose of this checklist is to determine if the Standard Project Requirements (SPR) and any Project Specific Requirements (PSR) have been properly incorporated into the project.

Project Name: CAL FIRE Unit: Location:	
Project Coordinator and Contact Information: 	
Treatment Type: <input type="checkbox"/> <i>WUI</i> <input type="checkbox"/> <i>Fuel Breaks</i> <input type="checkbox"/> <i>Ecological Restoration</i>	

Date:

Observers:

N/A	Yes	No	Design features & Standard Project Requirements (SPR) :	¹ Reference	² Project Stage	Describe conditions if relevant, and where deficiencies occur. If answer to question is "No," describe proposed corrective actions and provide date completed. Attach additional sheets as necessary.	Date Complete
			Were the administrative standards implemented in the project?	ADM-1 through 7	P - I		
			Was prescribed fire utilized as specified in the SPR?	FBE-1 through 3	P - I		
			Did the project description adequately describe the impacts to the aesthetics?	AES-1	P - C		

1- SPR or PSR standard

2- P = Planning; I = Implementation; C = Completion

California Department of Forestry and Fire Protection

VTP Implementation Monitoring Checklist

The purpose of this checklist is to determine if the Standard Project Requirements (SPR) and any Project Specific Requirements (PSR) have been properly incorporated into the project.

N/A	Yes	No	Design features & Standard Project Requirements (SPR) :	¹ Reference	² Project Stage	Describe conditions if relevant, and where deficiencies occur. If answer to question is "No," describe proposed corrective actions and provide date completed. Attach additional sheets as necessary.	Date Complete
			Would the project result in any unique air quality impacts that were not addressed in the VTP Program EIR?	AIR – 1 through 12	I, P - C		
			Have all biological resources SPR been incorporated into the project?	BIO-1 through 13	P - I		
			Have all cultural resources SPR been incorporated into the project?	CUL – 1 through 5	P - I		
			Have all geology and soils SPR been incorporated into the project?	GEO –1 & 2	P - I		
			Have all GHG SPRs been incorporated into the project?	CC -1 through 4	P -I		
			Have all hazard and hazardous materials SPRs been incorporated into the project?	HAZ –1 through 14	P, I - C		
			Have all hydrology and water quality SPRs been incorporated into the project?	HYD-1 through 17	P, I - C		
			Have all noise SPRs been incorporated into the project?	NSE-1 through 6	P, I - C		

1- SPR or PSR standard

2- P = Planning; I = Implementation; C = Completion

California Department of Forestry and Fire Protection

VTP Implementation Monitoring Checklist

The purpose of this checklist is to determine if the Standard Project Requirements (SPR) and any Project Specific Requirements (PSR) have been properly incorporated into the project.

N/A	Yes	No	Design features & Standard Project Requirements (SPR) :	¹ Reference	² Project Stage	Describe conditions if relevant, and where deficiencies occur. If answer to question is "No," describe proposed corrective actions and provide date completed. Attach additional sheets as necessary.	Date Complete
			Have all transportation SPRs been incorporated into the project	TRA-1 & 2	I-C		
List the Project Specific Requirements (PSR)							

1- SPR or PSR standard

2- P = Planning; I = Implementation; C = Completion

California Department of Forestry and Fire Protection

VTP Implementation Monitoring Checklist

The purpose of this checklist is to determine if the Standard Project Requirements (SPR) and any Project Specific Requirements (PSR) have been properly incorporated into the project.

N/A	Yes	No	Design features & Standard Project Requirements (SPR) :	¹ Reference	² Project Stage	Describe conditions if relevant, and where deficiencies occur. If answer to question is "No," describe proposed corrective actions and provide date completed. Attach additional sheets as necessary.	Date Complete
(Continued) List the Project Specific Requirements (PSR)							

1- SPR or PSR standard

2- P = Planning; I = Implementation; C = Completion

N/A	Yes	No	Design Features and BMPs:	¹ Reference	² Project Stage	Describe conditions if relevant, and where deficiencies occur. If answer to question is "No," describe proposed corrective actions and provide date completed. Attach additional sheets as necessary.	Date Complete
(Continued) List the Project Specific Requirements (PSR)							

Notes:

I.5.2 STANDARD PROJECT REQUIREMENTS

ADMINISTRATIVE STANDARD PROJECT REQUIREMENTS

ADM-1: Prior to the start of operations, the project coordinator shall meet with the contractor to discuss all resources that must be protected using standard project requirements (SPRs). If burning operations are done with CAL FIRE personnel, the Battalion Chief and/or their Company Officer designee shall meet with the project coordinator onsite prior to operations to discuss resource protection measures. Additionally, the project coordinator shall specify the resource protection measures and details of the burn plan in the incident action plan (IAP) and shall attend the pre-operation briefing to provide further information.

ADM-2: Prior to the start of operations, and at the discretion of the project coordinator, a registered professional forester (RPF) shall flag and/or fence all protected resources for avoidance during operations. The RPF shall also be required to engage other resource professionals that may address issues beyond the RPF's experience or expertise, as required by the Professional Foresters Licensing Law (Public Resources Code Sections 752(b)). The project coordinator or designee shall remove the fencing from around the protected resource after project completion.

ADM-3: The project coordinator or designee shall monitor SPR implementation (and effectiveness in some cases) as an adaptive management tool. If a SPR does not perform adequately to protect the specified resource, the project coordinator will determine adaptation strategies, in coordination with the contractor and/or CAL FIRE personnel, and require their implementation.

ADM-4: If monitoring is necessary (e.g., effectiveness monitoring), the project coordinator or designee shall notify the party responsible for monitoring a minimum of three weeks in advance of operations. More advanced notification is encouraged from project coordinators to parties responsible for more rigorous monitoring activities.

ADM-5: All ground disturbing treatment activities, including land clearing and bull dozer line construction, shall be suspended when a red flag warning is issued by the local National Weather Service office.

ADM-6: The project coordinator or designee shall consult with the USFS, CAL FIRE, or other public agencies as appropriate to develop a list of past, current, and reasonably foreseeable probable future projects within the planning

watershed of the proposed project. If the total combined acreage disturbed in the planning watershed exceeds 20% in a 10-year period, compliance with HYD-16 must be met prior to any ground disturbing operations. Projects that may combine with VTP projects to create the potential for significant effects include, but are not limited to, controlled burning, fuel reduction, and commercial timber harvesting.

ADM-7: Each CAL FIRE Unit shall not conduct more than five simultaneous VTP projects on any day. No more than one of these projects shall be a prescribed burn, unless additional prescribed burns have been approved by the local air district having authority over the project area. In no case will CAL FIRE conduct more than 15 simultaneous prescribed fire projects statewide.

AESTHETICS-RELATED STANDARD PROJECT REQUIREMENTS

AES-1: See **BIO-5** for shrublands in San Diego, Imperial, Riverside, Orange, Los Angeles, Ventura, Santa Barbara, and San Bernardino counties.

AIR QUALITY-RELATED STANDARD PROJECT REQUIREMENTS

AIR-1: The project shall comply with all local, state, and federal air quality regulations and ordinances. The local Air Pollution Control District (APCD) or Air Quality Management District (AQMD) will be contacted to determine local requirements.

AIR-2: Prior to approval of an CAL FIRE Unit project under the VTP, the project coordinator shall model the project's CAP emissions and compare the projected emissions levels to the thresholds identified by the local air district. If emissions levels exceed air district thresholds, consultation of the air district will occur.

AIR-3: Burning shall only be done in compliance with the burn authorization program of the local air district having jurisdiction over the project area. Authorization to burn shall be received no more than 48 hours prior to ignition. All projects greater than 10 acres or estimated to release more than 1 ton of particulate matter will prepare a smoke management plan. An example smoke management plan can be found in Appendix J.

AIR-4: Fire emissions and fire behavior shall be planned, predicted, and monitored in accordance with SPRs FBE-1, FBE-2, and FBE-3 with the goal of minimizing air pollutant emissions.

AIR-5: Dust control measures shall be implemented in accordance with SPRs Hyd-9 with the goal of minimizing fugitive dust emissions.

AIR-6: The speed of activity-related trucks, vehicles, and equipment traveling on unpaved areas shall be limited to 15 miles per hour (mph) to reduce fugitive dust emissions.

AIR-7: In areas where sufficient water supplies and access to water is available, all visible dust, silt, or mud tracked-out on to public paved roadways as a result of project treatment activities shall be removed at the conclusion of each work day, or a minimum of every 24 hours for continuous fire treatment activities.

AIR-8: Ground-disturbing treatment activities, including land clearing and bull dozer lines, shall be suspended when there is a visible dust transport.

AIR-9: Ground-disturbing treatment activities shall not be performed in areas identified as “moderately likely to contain naturally occurring asbestos (NOA)” according to maps and guidance published by the California Geological Survey (CGS), unless an Asbestos Dust Control Plan is prepared by the Operational Unit and approved by the air district(s) with jurisdiction over the project site. This determination would be based on a CGS publication titled *A General Location Guide for Ultramafic Rocks in California – Areas More Likely to Contain Naturally Occurring Asbestos* (Churchill and Hill 2000), or whatever more current guidance from CGS exists at the time the VTP project is evaluated. Any NOA-related guidance provided by the applicable local air district shall also be followed. If, it is determined that NOA could be present at the project site, then an Asbestos Dust Control Plan shall be prepared and implemented in accordance with Title 17 of the Public Health CA Code of Regulations of Section 93105.

AIR-10: Operation of large diesel- or gasoline-powered activity equipment (i.e., greater than 50 horsepower [hp]) shall not exceed 16 equipment-hours per day, where an equipment-hour is defined as one piece of equipment operating for one hour (daily CAPs, TACs, GHGs).

AIR-11: All diesel- and gasoline-powered equipment shall be properly maintained according to manufacturer's specifications, and in compliance with all state and federal emissions requirements. Maintenance records shall be available for verification.

AIR-12: In accordance with CCR Section 80160(b), all burn prescriptions shall require the submittal of a smoke management plan for all projects greater than 10 acres or are estimated to produce more than 1 ton of particulate matter. Example of a smoke management plan is in Appendix J.

Mitigation Measure AIR-1

To achieve compliance with local air district emission thresholds in the San Joaquin Valley Unified Air Quality Management District, simultaneously projects within that air district will be constrained to appropriate number as not to exceed air quality standards. As a result, the Program shall implement the following:

- CAL FIRE shall not allow more than 7 simultaneous treatment activities to occur in the San Joaquin Valley Unified Air Quality Management District.

BIOLOGICAL STANDARD PROJECT REQUIREMENTS

BIO-1: Projects shall be designed to avoid significant effects and avoid take of rare, threatened, and endangered species, as defined in CEQA Guidelines Section 15380.

BIO-2: The project coordinator shall run a nine-quad search or larger search area (may be required is a project is on the boundary of two USGS quad maps) of the area surrounding the proposed project for rare, threatened, and endangered species, using at a minimum, the California Natural Diversity Database (CNDDDB) or its successor.

BIO-3: The project coordinator shall write a summary of all special-status species identified in the biological scoping including the CNDDDB search with a preliminary analysis, identifying which species would be affected by the proposed project. A field review will then be conducted by the project coordinator to identify the presence or absence of any special status species, or appropriate habitat for special status species, within the project area.

BIO-4: The project coordinator, shall ensure that a CAL FIRE Environmental Coordinator analyze impacts to CNDDDB species, and shall submit the summary and preliminary analysis to the CDFW, USFWS, and [if applicable] NOAA Fisheries for consultation. The preliminary analysis shall be accompanied with a standard letter containing the following:

- A written description of the project location and boundaries
- Brief narrative of the project objectives
- A description of the types of activities used in the project (e.g., prescribed burning; mastication) and associated acreages
- A project and general location map. Project map shall be of sufficient scale to indicate the spatial extent of activities within the project area
- The output from the CNDDDB run, including a map of any special status species located during the field review, and the SPRs that will be implemented to minimize impacts on the identified special status species.
- A request for information regarding the presence and absence of rare, threatened, and endangered plant and animal species, including any applicable HCPs, in the project vicinity, and potential take avoidance measures to be implemented as PSRs.
- An offer to schedule a day to visit the project area with the project coordinator.

BIO-5: Vegetation treatment projects that are not deemed necessary to protect critical infrastructure or forest health in San Diego, Imperial, Riverside, Orange, Los Angeles, Ventura, Santa Barbara, Kern, and San Bernardino counties shall:

- Be designed to prevent vegetation type conversion.
- Not take place in vegetation that has not reached the age of median fire return intervals.
- Not re-enter treatment areas for maintenance in an interval shorter than the median fire return interval outside of the wildland urban interface and excluding fuel break maintenance.
- Not take place in old-growth chaparral without consultation regarding the potential for significant impacts with the CDFW and the CNPS.
- Take into account the local aesthetics, wildlife, and recreation of the shrub-dominated subtype during the planning and implementation of the project.

- During the project planning phase provide a public workshop, or public notice in a newspaper that is circulated locally describing the proposed project during the project planning phase for projects outside of the WUI. The notification will be used to inform stakeholders and to solicit information on the potential for significant impacts during the project planning phase.

BIO-6: In shrublands containing native oaks, treatments may incorporate retention of older, acorn producing oaks to create deer forage. CAL FIRE or applicants may plant other vegetation to promote species diversity and improve wildlife habitat, when such practices are not in conflict with program goals.

BIO-7: A minimum 50 foot avoidance buffer shall be established around any special status animal, nest site, or den location; and a minimum 15 foot avoidance buffer shall be established around any special status plant within the project area. Additional buffer distances may be required through consultation with the appropriate State or Federal agencies, or a qualified biologist to avoid significant effects to special status species (see BIO-4).

BIO-8: In order to reduce the spread of new invasive plants, only certified weed-free straw and mulch shall be used.

BIO-9: During the planning phase if the project coordinator determines that there is a significant risk of introducing invasive plants, then project specific mitigation measures shall be developed using principles outlined in the document “Preventing the Spread of Invasive Plants: Best Management Practices for Land Managers (3rd edition” or other relevant documents). Coordination of the mitigations will also include consultation with CDFW.

BIO-10: If water drafting becomes a necessary component of the proposed project, drafting sites shall be planned to avoid adverse effects to special-status aquatic species and associated habitat, in-stream flows, and depletion of pool habitat. Screening devices shall be used for water drafting pumps, and pumps with low entry velocity shall be used to minimize removal of aquatic species, including juvenile fish, amphibian egg masses, and tadpoles, from aquatic habitats.

BIO-11: Aquatic habitats and species shall be protected through the use of watercourse and lake protection zones (WLPZ), as described in California Forest Practice Regulations (14 CCR). Other operational restrictions may be identified through a consultation with CDFW and RWQCB (see BIO-4). See HYD-3 for these standard protection measures.

BIO-12: For projects that require a non-construction-related CDFW Streambed Alteration Agreement, any BMPs identified in the agreement shall be developed and implemented.

BIO-13: If any special status species are identified within the project area, an onsite meeting shall occur between the project coordinator and operating contractor. At this meeting the project manager shall conduct a brief review of life history, field identification, and habitat requirements for each special-status species, their known or probable locations in the vicinity of the treatment site, project specific requirements or avoidance measures, and necessary actions if special-status species or sensitive natural communities are encountered.

CLIMATE CHANGE-RELATED STANDARD PROJECT REQUIREMENTS

CC-1: Prior to approval of Operational Unit project under the VTP, the project coordinator shall run the FOFEM and other GHG-emissions models as appropriate to the treatment activity, to confirm that GHG emissions will be the minimum necessary to achieve risk reduction objectives.

CC-2: Carbon sequestration measures shall be implemented per SPRs BIO-5 and BIO-6 to reduce total carbon emissions resulting from the treatment activity.

CC-3: Treatment activity-related air pollutant emission control measures for prescribed burns shall be implemented in accordance with SPRs AIR-3 and AIR-4.

CC-4: Treatment activity-related air pollutant emission control measures for equipment operation hours, practices, and maintenance shall be implemented in accordance with SPRs AIR-11 and AIR-12.

ARCHAEOLOGY AND CULTURAL RESOURCES-RELATED STANDARD PROJECT REQUIREMENTS

CUL-1: The project coordinator or designee shall order a current records check as per the most current edition of “Archaeological Review Procedures for CAL FIRE Projects” (CAL FIRE, 2010, see appendix H). The project coordinator may contact landowners within the project area who might have already conducted a records check for a Timber Harvest

Plan or other project on their land to limit costly redundant records searches. Records checks must be less than five years old at the time of project submission.

CUL-2: Using the latest Native Americans Contact List from the CAL FIRE website, the project coordinator or designee shall send all Native American groups in the counties where the project is located a standard letter notifying them of the project. The letter shall contain the following:

- A written description of the project location and boundaries.
- Brief narrative of the project objectives.
- A description of the types of activities used in the project (e.g., prescribed burning, mastication) and associated acreages.
- A project and general location map. Project map shall be of sufficient scale to indicate the spatial extent of activities within the project area.
- A request for information regarding potential cultural impacts from the proposed project.

CUL-3: The project coordinator or designee shall contact a CAL FIRE archaeologist or CAL FIRE Certified Archaeological Surveyor to arrange for a survey of the project area if necessary. The specific requirements need to comply with the most current edition of “Archaeological Review Procedures for CAL FIRE Projects” (CAL FIRE, 2010).

CUL-4: Protection measures for archaeological and cultural resources shall be developed through consultation with a CAL FIRE archeologist. If new archaeological sites are discovered, the project coordinator or designee shall notify Native American groups of the resource and the protection measure with the standard second letter (see appendix H). Locations of archaeological resources should not be disclosed on a map to the members of the public including Native American groups.

CUL-5: If an unknown site is discovered during project operations, operations within 100 feet of the identified boundaries of the new site shall immediately halt, and the project will avoid any more disturbances. A CAL FIRE Archaeologist shall be contacted for an evaluation of the significance of the site. In accordance with the California Health and Safety Code, if human remains are discovered during ground disturbing activities, CAL FIRE and/or the project contractor(s) shall immediately halt potentially damaging activities in the area of the burial and notify the County Coroner and a qualified professional archaeologist to determine the nature and significance of the remains.

FIRE BEHAVIOR-RELATED STANDARD PROJECT REQUIREMENTS

FBE-1: The prescribed fire burn prescription shall be designed to initiate a surface fire of sufficient intensity that will only consume surface and ladder fuels. The prescribed fire burn prescription shall be designed and implemented to protect soil resources from direct soil heating impacts. Soil damage or will not occur as a result of this project.

FBE-2: A burn plan shall be created using the burn plan template. The burn plan shall include a fire behavior model output of BEHAVE or other fire behavior modeling simulation and performed by a fire behavior technical specialist (S-490 qualified). The burn plan shall be created with input from the vegetation project's Battalion Chief and a fire behavior technical specialist (S-490 qualified).

FBE-3: The project coordinator shall run a First Order Fire Effects Model (FOFEM) to analyze fire effects. The results of the analysis shall be included with the Burn Plan. FOFEM calculates consumption of fuels, tree mortality, predicted emissions, GHG emissions, and soil heating.

FBE-4: Approximately two weeks prior to commencement of prescribed burning operations the project coordinator shall 1) post signs along the closest major road way to the project area describing the project, timing, and requesting for smoke sensitive persons in the area to contact the project coordinator; 2) publish a public interest notification in a local newspapers describing the project, timing, and requesting for smoke sensitive persons in the area to contact the CAL FIRE project coordinator; 3) send the local county supervisor a notification letter describing the project, its necessity, timing, and summarize the measures being taken to protect the environment and prevent escape; and 4) develop a list of smoke sensitive persons in the area and contact them prior to burning.

GEOLOGIC STANDARD PROJECT REQUIREMENTS

GEO-1: An RPF or licensed geologist shall assess the project area for unstable areas and unstable soils as per 14 Section CCR 895.1 of the California Forest Practice Rules. Guidance on identifying unstable areas is contained in the California Licensed Foresters Association *Guide to Determining the Need for Input From a Licensed Geologist During THP Preparation* and California Geological Survey (CGS) Note 50 (see Appendix C). Priority will be placed on assessing watercourse-adjacent slopes greater than 50%. If unstable areas or soils are identified within the project area, are

unavoidable, and are potentially directly or indirectly affected by the project operations, a licensed geologist (P.G. or C.E.G.) shall conduct a geologic assessment to determine the potential for project-induced impacts and mitigation strategies. Project shall incorporate all of the recommended mitigations. Geologic reports should cover the topics outlined in CGS Note 45 (see Appendix C).

GEO-2: The potential impacts of prescribed fire on geologic processes shall be reduced by following the Fire Behavior-related SPRs FBE-1, FBE-2, and FBE-3.

HAZARDS AND HAZARDOUS MATERIAL-RELATED STANDARD PROJECT REQUIREMENTS

HAZ-1: Prior to the start of vegetation treatment activities, the project coordinator shall conduct an Envirofacts web search to identify any known contamination sites within the project area. If a proposed vegetation treatment project occurs in areas located on the DTSC Cortese List, no activities shall occur within 100 feet of the site boundaries.

HAZ-2: Prior to the start of vegetation treatment activities, the project coordinator or contractor shall inspect all equipment for leaks and regularly inspect thereafter until equipment is removed from the site.

HAZ-3: Prior to the selection of treatment activities, CAL FIRE shall determine if there are viable, cost-effective, non-herbicide treatment activities that could be implemented prior to the selection of herbicide treatments.

HAZ-4: Prior to the start of herbicide treatment activities, the project coordinator shall prepare a Spill Prevention and Response Plan (SPRP) to provide protection to onsite workers, the public, and the environment from accidental leaks or spills of herbicides, adjuvants, or other potential contaminants. This plan shall include (but not be limited to):

- A map that delineates VTP staging areas, where storage, loading, and mixing of herbicides will occur;
- A list of items required in a spill kit onsite that will be maintained throughout the life of the project;
- Procedures for the proper storage, use, and disposal of any herbicides, adjuvants, or other chemicals used in vegetation treatment.

HAZ-5: If remediation of hazardous contamination is needed, the project coordinator shall hire a licensed contractor with expertise in performing such work. The contractor shall comply with all laws and regulations governing worker safety and the removal and disposal of any contaminated material.

HAZ-6: All pesticide use shall be implemented consistent with Pest Control recommendations prepared annually by a licensed Pest Control Advisor.

HAZ-7: All appropriate laws and regulations pertaining to the use of pesticides and safety standards for employees and the public, as governed by the U.S. Environmental Protection Agency, the California Department of Pesticide Regulation, and local jurisdictions shall be followed. All applications shall adhere to label directions for application rates and methods, storage, transportation, mixing, and container disposal. All contracted applicators shall be appropriately licensed by the state. The project coordinator shall coordinate with the County Agricultural Commissioners, and all required licenses and permits shall be obtained prior to pesticide application.

HAZ-8: Projects shall avoid herbicide treatment in areas adjacent to water bodies and riparian areas. Application of herbicides shall be outside the WLPZ and ELZ as specified in HYD-3, or at the distances set forth in the herbicide label requirements, whichever is greater. No aerial spraying of herbicides shall occur under this Program EIR.

HAZ-9: The following general application parameters shall be employed during herbicide application:

- Application shall cease when weather parameters exceed label specifications, when sustained winds at the site of application exceeds seven miles per hour (MPH), or when precipitation (rain) occurs or is forecasted with greater than a 40 percent probability in the next 24-hour period to prevent sediment and herbicides from entering the water via surface runoff;
- Spray nozzles shall be configured to produce a relatively large droplet size;
- Low nozzle pressures (30-70 pounds per square inch [PSI]) shall be observed; and
- Spray nozzles shall be kept within 24 inches of vegetation during spraying.

Drift avoidance measures shall be used to prevent drift in locations where target weeds and pests are in proximity to special-status species or their habitat. Such measures can consist of, but would not be limited to the use of plastic shields around target weeds and pests and adjusting the spray nozzles of application equipment to limit the spray area.

HAZ-10: All herbicide and adjuvant containers shall be triple rinsed with clean water at an approved site, and the rinsate shall be disposed of by placing it in the batch tank for application per 3 CCR § 6684. Used containers shall be punctured on the top and bottom to render them unusable, unless said containers are part of a manufacturer's container recycling program, in which case the manufacturer's instructions shall be followed. Disposal of non-recyclable containers will be at legal dumpsites. Equipment would not be cleaned and personnel would not bathe in a manner that allows contaminated water to directly enter any body of water within the treatment areas or adjacent watersheds. Disposal of all pesticides shall follow label requirements and local waste disposal regulations.

HAZ-11: Storage, loading and mixing of herbicides shall be set back at least 150 feet from any aquatic feature or special-status species or their habitat or sensitive natural communities.

HAZ-12: Appropriate non-toxic colorants or dyes shall be added to the herbicide mixture where needed to determine treated areas and prevent over-spraying.

HAZ-13: For treatment activities located within or adjacent to public recreation areas, signs shall be posted at each end of herbicide treatment areas and any intersecting trails notifying the public of the use of herbicides. The signs shall consist of the following information: signal word, product name, and manufacturer; active ingredient; EPA registration number; target pest; treatment location; date and time of application; date which notification sign may be removed; and contact person with telephone number. Signs shall be posted at the start of treatment and notification will remain in place for 72 hours after treatment ceases.

HAZ-14: All heavy equipment shall be required to include spark arrestors or turbo chargers that eliminate sparks in exhaust, and have fire extinguishers onsite.

HYDROLOGIC AND WATER QUALITY-RELATED STANDARD PROJECT REQUIREMENTS

HYD-1: The project shall comply with all applicable water quality requirements adopted by the appropriate Regional Water Quality Control Board and approved by the State Water Board (i.e., Basin Plan).

HYD-2: During the planning phase the project coordinator shall submit a standard letter to the appropriate RWQCB containing the following:

- A written description of the project location and boundaries
- Brief narrative of the project objectives
- A description of the types of activities used in the project (e.g., prescribed burning, mastication) and associated acreages
- A project and general location map. Project map shall be of sufficient scale to indicate the spatial extent of activities within the project area
- Notification of whether the project drains directly into an impaired water body, and the type of water quality constituent(s) that is impairing the water body.
- A request for information and recommendations regarding the potential for significant water quality impacts from the proposed project and an offer to schedule a day to visit the project area with the project coordinator. The project shall incorporate the recommendations that prevent significant impacts to water quality as PSRs.

HYD-3: A WLPZ shall be established on each side of all Class I and II watercourses that is equal to the standard widths specified in the current CA Forest Practice Rules (Table 2.6-1). Fifty foot equipment limitation zones (ELZs) shall be established for Class III watercourses. Vegetation within the WLPZ or ELZ will not be disturbed by project activities, with the exception of backing prescribed fire. Class IV watercourse protections shall be PSRs specified in the PSA, and designed in conjunction with any recommendations from RWQCB staff.

Table I.5-1 Watercourse and lake protection zone buffer widths by watercourse classification and hill slope gradient (See HYD -3)
Note: ELZ-Equipment Limitation Zone, PSR-Project Specific Requirement

Water Class Characteristics or Key Indicator / Beneficial Use	1) Domestic supplies, including springs, on site and/or within 100 feet downstream of the project area and/or 2) Fish always or seasonally present onsite, includes habitat to sustain fish migration and spawning	1) Fish always or seasonally present offsite within 1000 feet downstream and/or 2) Aquatic habitat for non-fish aquatic species. 3) Excludes Class III water that are tributary to Class I waters	No aquatic life present, watercourse showing evidence of being capable of sediment transport to Class I and II water under normal high water flow conditions of timber operations	Man-made watercourses, usually downstream, established domestic, agricultural, hydroelectric supply or other beneficial use
Water Class	Class I	Class II	Class III	Class IV
Slope Class (%)	Width (ft.)	Width (ft.)	Width (ft.)	Width
<30	75	50	50 (ELZ)	PSR
30-50	100	75	50 (ELZ)	PSR
>50	150	100	50 (ELZ)	PSR

HYD-4: No direct ignition shall be allowed within the WLPZ or ELZs. However, it is acceptable for a fire to enter or back into a WLPZ's or ELZ's.

HYD-5: Compacted and/or bare linear treatment areas (e.g., fire breaks, roads, or trails) capable of generating storm runoff shall be drained via water breaks using the spacing guidelines contained in CCR Sections 914.6, 934.6, and 954.6 (c) of the California Forest Practice Rules.

HYD-6: Compacted and/or bare treatment areas shall be drained such that they are hydrologically disconnected from watercourses or lakes. Measures to hydrologically disconnect these areas shall be guided by consulting with Technical

Rule Addendum #5 of the California Forest Practice Rules – Guidance on Hydrologic Disconnection, Road Drainage, Minimization of Diversion Potential, and High Risk Crossings

HYD-7: No high ground pressure vehicles shall be driven through project areas when soils are wet and saturated to avoid compaction and/or damage to soil structure. Saturated soil means that soil and/or surface material pore spaces are filled with water to such an extent that runoff is likely to occur. Indicators of saturated soil conditions may include, but are not limited to: (1) areas of ponded water, (2) pumping of fines from the soil or road surfacing material during timber operations, (3) loss of bearing strength resulting in the deflection of soil or road surfaces under a load, such as the creation of wheel ruts, (4) spinning or churning of wheels or tracks that produces a wet slurry, or (5) inadequate traction without blading wet soil or surfacing materials.

HYD-8: When possible, bare soil will be mulched with onsite native vegetative material (e.g., cut material).

HYD-9: During dry, dusty conditions, unpaved roads shall be wetted using water trucks or treated with a non-toxic chemical dust suppressant (e.g., emulsion polymers, organic material). Any dust suppressant product used shall be environmentally benign (i.e., non-toxic to plants and shall not negatively impact water quality) and its use shall not be prohibited by the ARB, U.S. Environmental Protection Agency (EPA), or the State Water Resources Control Board. Exposed areas shall not be over-watered such that water results in runoff. The type of dust suppression method shall be selected by the contractor based on soil, traffic, site-specific conditions, and local air quality regulations.

HYD-10: Prior to the start of onsite activities, all equipment will be inspected for leaks and regularly inspected thereafter until equipment is removed from the project area. All contaminated water, sludge, spill residue, or other hazardous compounds will be contained and disposed of outside the boundaries of the site, at a lawfully permitted or authorized destination.

HYD-11: Staging areas shall be designated and located to prevent leakage of oil, hydraulic fluids, or other chemicals into watercourses or lakes.

HYD-12: All heavy equipment parking, refueling, and service shall be conducted within designated areas outside of the WLPZ or ELZ.

HYD-13: No new roads (including temporary roads) shall be constructed or reconstructed (reconstruction is defined as cutting or filling involving less than 50 cubic yards/0.25 linear road miles). Existing roads, skid trails, fire lines, fuel breaks, etc. that require reopening or maintenance shall have drainage facilities applied at the conclusion of the project that are at least equal to those of the California Forest Practice Rules.

HYD-14: Heavy equipment is prohibited on slopes exceeding 65 percent or on slopes greater than 50 percent where the erosion hazard rating is high or extreme. Heavy equipment is prohibited on slopes greater than 50 percent that lead without flattening to watercourses.

HYD-15: Burn piles shall not exceed 10 feet in length, width, or diameter, except when on landings or road surfaces.

HYD-16: At the Calwater Planning Watershed scale, if the combined acreage subjected to mechanical fuel treatments, prescribed fire, and logging exceed 20% of the watershed area within a 10-year timespan, an analysis will be performed to determine the potential for hydrologically-induced significant impacts of the proposed activity.

HYD-17: If herbivory is proposed to treat vegetation in a project area containing watercourses, then the following items must be addressed as PSRs:

- The project will require water on site in the form of an on-site stock pond outside the WLPZ or ELZ, or a portable water source located outside the WLPZ or ELZ.
- The project will specify animal containment measures in the PSA to prevent animals from entering the WLPZ and/or ELZs. These might include the use of fencing (i.e., fixed or portable), the use of guard or herd dogs, or the use of an on-site herder.

NOISE-RELATED STANDARD PROJECT REQUIREMENTS

NSE-1: Noise generating activities shall abide by the time-of-day restrictions established by local jurisdictions (i.e., city and/or county) if such noise would be audible to receptors located in applicable local jurisdictions. Cities and counties in California typically restrict noise to particular daytime hours. If the local applicable jurisdiction does not have a noise ordinance or policy restricting the time-of-day when noise-generating activities can occur, then noise-generating activities shall be limited to the hours of 0700 to 1900 Monday through Friday.

NSE-2: All powered equipment shall be used and maintained according to manufacturer's specifications.

NSE-3: Equipment engine shrouds shall be closed during equipment operation.

NSE-4: All heavy equipment and equipment staging areas shall be located as far as possible from nearby noise-sensitive land use (e.g., residential land uses, schools, hospitals, places of worship).

NSE-5: All motorized equipment shall be shut down when not in use. Idling of equipment or trucks shall be limited to 5 minutes.

NSE-6: Public notice of the proposed project shall be given to notify noise-sensitive receptors of potential noise-generating activities.

TRAFFIC-RELATED STANDARD PROJECT REQUIREMENTS

TRA-1: Public road ways leading into project area shall be signed to warn traffic of the project activities that are taking place. Road signage shall be posted the morning prior to the commencement of burning operations and shall remain until all operations are completed.

TRA-2: Direct smoke and dust impacts to roadway visibility and the indirect distraction of operations shall be considered during burning operations. Traffic control operations shall be implemented if weather conditions inhibiting smoke and dust dispersion have the potential to impact roadway visibility to motorists.

I.5.3 PHOTO POINT MONITORING

VTP Project Name or N.:				Photographer:		
Camera Type/Brand:				Date:		
Photo Point #	Pre or Post Project	Location Description	GPS Coordinates	Heading	Photo #	File Saved As:
Enter photo point #	Enter "Pre" or "Post" for project status	Describe where the photograph was taken and what feature(s) it's capturing	Coordinates (decimal degrees)	Enter compass heading	Enter # from digital camera	Enter file name as described in the protocol

I.5.4 FOR THE VTP PHOTO-POINT MONITORING DATA SHEET, RECORD THE FOLLOWING ITEMS:

VTP Project Name or Number:

Photographer: Last name of inspector or biologist

Camera Type/Brand: Record whether the camera used is smart phone or digital camera and the brand (ie, Smart phone, Samsung Galaxy S5 or Digital camera, Canon Powershot S110). It is important to use the same camera for pre-project and post-project photos.

Photo Point #: Record the number of the photo point. When returning for the post-project photo, return to the same photo point number location. Additionally, mark the photo point location on a copy of the project map.

Pre or Post Project: Record whether the photo is capturing “Pre” or “Post” project

Location Description: Provide a brief description of the location from which the photo is being taken and provide any landmarks associated with the location; downed log, 3rd fence post, road markers, etc.

GPS Coordinates: Record GPS coordinates, preferably in decimal degrees

Heading: Provide a compass heading for the direction in which the photo was taken. Take photos straight on when feasible and avoid taking photos pointed up to the canopy or down to the ground with an azimuth greater than 30% in either direction. If this can't be achieved, then be sure to record the azimuth.

Photo #: Record the photo number from the smart phone or digital camera

File Saved As: All digital photos shall be saved with the same naming convention that identifies the project, photo point, and project status.

Two photo-points are required for each activity type (e.g., prescribed burning, mechanical, hand treatment, etc) implemented in a project area. For example, if prescribed burning is utilized, then two series of pre- and post-treatments are required from different locations for that activity type. The two sets of photo-points should represent the range of fuel conditions in the project area treated by a particular activity type.

Voluntary pre- and post-treatment photo-points are also encouraged to be taken around:

- Habitat retention areas;
- Watercourse and Lake Protection Zones and/or equipment limitation zone;
- Archaeological sites within the project area;
- Unstable areas if they are within the project area;

It is best to take photos when light is optimal, such as in the early morning, late afternoon, or slightly overcast. Avoid taking photos when the visibility is poor such as in the rain, fog, or snow. Take photos with the sun at your back, when feasible. It is important to check each photo to determine if it is clear enough and provides enough detail to capture the feature.

I.5.5 INTERACTION REPORT

INTERACTION REPORT

**THE PETERSON FIRE
(CAFKU 008548)**

and

**THE CRESSMAN FUEL MODIFICATION
ZONE**

July 12 – 15, 2004

Intro

The Peterson Fire was a wildland fire reported at 1205 hours on July 12, 2004 in Eastern Fresno County. As the initial attack Incident Commander, Battalion Chief Jim Smith, arrived at the scene, he found the fire rapidly spreading uphill threatening structures above and on each flank. The fire was burning in a mix of chaparral and timber mid-slope on a south aspect. Fuel moistures from surrounding counties indicate that the current fuel moistures were at least one month ahead of normal and were at or near critical levels. The 1200 hour weather reported at the Mountain Rest RAWS Station approximately 2 miles northwest of the incident at roughly the same elevation was as follows: Temperature 89 degrees Fahrenheit, wind southwest at 5 – 11 mph, relative humidity 17% and fuel moisture 4.7%. The fire was rapidly spreading towards the recently completed Cressman Road Fuel Modification Zone (FMZ).

Battalion Chief Jim Smith had these words to help explain how he considered and incorporated the Cressman Road FMZ into his incident strategy and tactics:

As Incident Commander on the Peterson Fire, the Cressman Fuel Modification Project provided me with:

- 1) The confidence that the head of the fire would be stopped or slowed when it reached the FMZ;*
- 2) That it would serve as a safe point of attack for firefighters even at the head of the fire;*
- 3) That firefighters could “anchor-in” at the FMZ and safely make a downhill hoselay along the flank of the fire;*
- 4) It significantly reduced the number of firefighting resources ordered for the incident;*
- 5) Fire intensities and subsequent resource damage was significantly reduced in the FMZ compared to the non-treated areas in the fire perimeter.*

Background

CRESSMAN ROAD FUEL MODIFICATION ZONE

The California Department of Forestry and Fire Protection (CDF), in cooperation with the Pine Ridge Property Owners Association, the Highway 168 Fire Safe Council and the California Department of Corrections developed the Cressman Road FMZ. A FMZ is also commonly referred to as a shaded fuel break. A FMZ is an area where selected vegetation has been removed in such a way as to break the horizontal and vertical continuity of forest fuels.

The Cressman FMZ project is located along the Cressman Road in the Pine Ridge Area of eastern Fresno County below Shaver Lake. The project elevation ranges from 4,600 to 5,000 feet and is located mid-slope on a mostly southern aspect. The subdivision consists of approximately 75 residences on 113 parcels. The dwellings are a mix of seasonal and year-round use. The Cressman Road FMZ involved 60 parcels and 57 different landowners.

The purpose of this project was to try and increase the level of safety for both residents and firefighters that may be entering and/or leaving the Cressman Road area under wildfire conditions.

This increased level of safety has been achieved through the selective removal of vegetation along Cressman Road. The Cressman Road area was selected for this project because of several reasons:

- 1) The Fresno/Kings Unit of the California Department of Forestry and Fire Protection has identified the Pine Ridge area as a priority area for fuel reduction projects. This area was selected as a priority because of its high fuel loading, its potential for a large damaging fire and its high population density intermixed within the wildland.
- 2) The Highway 168 Fire Safe Council has identified the Pine Ridge area as a priority area for fuel reduction projects for similar reasons.
- 3) Cressman Road is a single lane road, open to the public, which accesses approximately 113 parcels and 75 residences.
- 4) At the initial discussion stages of this project, the Pine Ridge Property Owners Association expressed interest in and support of the proposed project.

This project was paid for by funding from the California Department of Forestry and Fire Protection as well as grant funding from the US Forest Service through the National Fire Plan. The Fresno/Kings Unit of the California Department of Forestry and Fire Protection was awarded the funding to complete the multi-year project.

Participation in this project was completely voluntary on the part of landowners. Landowners participating in the project needed to sign an agreement with CDF prior to any work being done on their property. There was no cost to landowners that participated.

Inmate firefighting crews, under the supervision of CDF personnel were utilized to develop the FMZ. These crews utilized chainsaws and hand tools to selectively remove vegetation within the project area. The vegetation that was removed was either piled and burned during safe conditions or chipped by the crews.

The FMZ extends along Cressman Road and Lower Cressman Road from Highway 168 to the National Forest boundary. In addition, it includes approximately the first quarter mile of Upper Cressman Road. Within the FMZ, vegetation was selectively removed within approximately 200 feet of either side of the roadway. This zone width varied based on topographic features and vegetation conditions. Consideration was given to screening of homes located within and/or adjacent to the zone.

Treatment Prescription

As stated above, this project selectively removed un-merchantable vegetation in order to break the horizontal and vertical continuity of forest fuels. The following specifications applied to vegetation removal:

- 1) Trees removed did not exceed a nine (9) inch diameter at breast height (DBH) i.e. 4.5 feet above the ground.
- 2) Trees were removed in order to eliminate fuel ladders and achieve crown separation.
- 3) Trees saved were selected based on the following criteria:
 - a. Straight trunk with no defects, generally healthy and free of insects or disease.
 - b. Save trees were selected in the following order of preference: black oak, ponderosa pine, sugar pine, Douglas-fir, white fir, incense cedar.

- 4) Remaining trees were pruned as follows:
 - a. Trees under a six (6) inch DBH retained a minimum of a 50% live crown.
 - b. Trees over a six (6) inch DBH were pruned to ten (10) feet above the ground.
- 5) The majority of brush was removed so as to achieve a separation of horizontal fuels.
- 6) Down trees and logs on the ground were removed when feasible.

Removed vegetation was piled and burned and/or chipped. Burn piles were located away from watercourses and residual trees. All pile burning was conducted in accordance with Air Pollution Control District regulations.

Future project maintenance will involve removal of vegetative re-growth, additional thinning and additional pruning. It is anticipated that individual landowners will be able to do the bulk of the project maintenance now that the initial development phase is over.

Cressman Road FMZ Project Costs

Various funding sources were used to complete the project. The first source of funds was from Fuel Load Reduction funding provided to CDF by the California State Legislature in Fiscal Year 1999. The next source of funds were from two Wildland Urban Interface Grants provided by the National Fire Plan and administered by the U.S. Forest Service.

1999 CDF funds:	\$ 3,000.00
2001 WUI funds:	\$53,548.61
<u>2002 WUI funds:</u>	<u>\$36,660.67</u>
Total:	\$93,209.28

$\$93,209.28 / 151 \text{ acres treated} = \$617.28 \text{ per acre treatment costs}$

These funds do not include budgeted personnel time.

Cost Effectiveness

Peterson Fire Suppression costs: \$1.4 million
 $\$1.4 \text{ million} / 73 \text{ acres} = \mathbf{\$19,178 \text{ per acre fire suppression cost}}$
Cressman FMZ Costs: \$93,209.28
 $\$93,209 / 151 \text{ acres} = \mathbf{\$617 \text{ per acre FMZ treatment cost}}$
Estimated Potential Loss w/o Cressman Road FMZ: \$65 million*

The cost effectiveness of fuel load reduction projects is often questioned. When the cost of a project is compared to the cost of an extended attack wildfire, the initial up-front costs of a project become justifiable.

*Estimated potential fire size of 1,500 acres. Estimated 200 homes within the 1,500 acres. Conservative average home value of \$325,000. Does not include watershed or infrastructure values.

Fire Behavior

US Forest Service Battalion Chief, David Cooper observed the fire behavior as the fire approached the FMZ. He stated that the fire was torching in single trees with short crown runs as it approached the FMZ. Once the fire reached the FMZ the fire dropped to the surface and ground fuels and slowly spread through the FMZ until it reached Cressman Road. Battalion Chief David Cooper also stated that there were in excess of 20 spot fires at the head of the fire. Most of the spot fires occurred in the FMZ and were easily observed and extinguished. One of the spot fires occurred along the left shoulder of the fire, outside of the FMZ. This spot fire grew to approximately one acre in size before it was noticed and extinguished.

The attached photos help document and validate the observed fire behavior. The most noticeable indicator is the lack of torched trees in the FMZ. In the untreated area, single trees and groups of trees torched with short crown runs consuming all of the available fuels. In the FMZ, the surface fuels, primarily bear clover, were consumed and the trees were only scorched.

Other Considerations

The ultimate credit for the success of the Cressman Road FMZ project belongs to citizens of the Pine Ridge Property Owners Association (PRPOA), the Pine Ridge Volunteer Fire Dept. and the Highway 168 Fire Safe Council.

The PRPOA listened to CDF's concern for their area and was receptive of Battalion Chief, Bill Johnson's proposal to create the FMZ. With encouragement from the Highway 168 Fire Safe Council, the PRPOA signed up for the FMZ project and implemented several other Pre-fire actions in their community. The PRPOA made road signs that identified addresses, escape routes and water sources. The PRPOA created an emergency manual that contained plans and information for emergencies in their community. The PRPOA also formed the Pine Ridge Volunteer Fire Department. In 2003 the PRPOA was awarded the National Bronze Smokey Bear Award for their accomplishments in Pre-fire planning and fire prevention.

Battalion Chief David Cooper also added that he observed incredible teamwork by the newly formed Pine Ridge Volunteer Fire Department personnel and the various paid and volunteer fire departments that responded to the fire. He felt that the close working relationship and preparedness training that the Pine Ridge Volunteer fire Department has conducted with CDF and US Forest Service through the Highway 168 Fire Safe Council paid off.

Conclusion

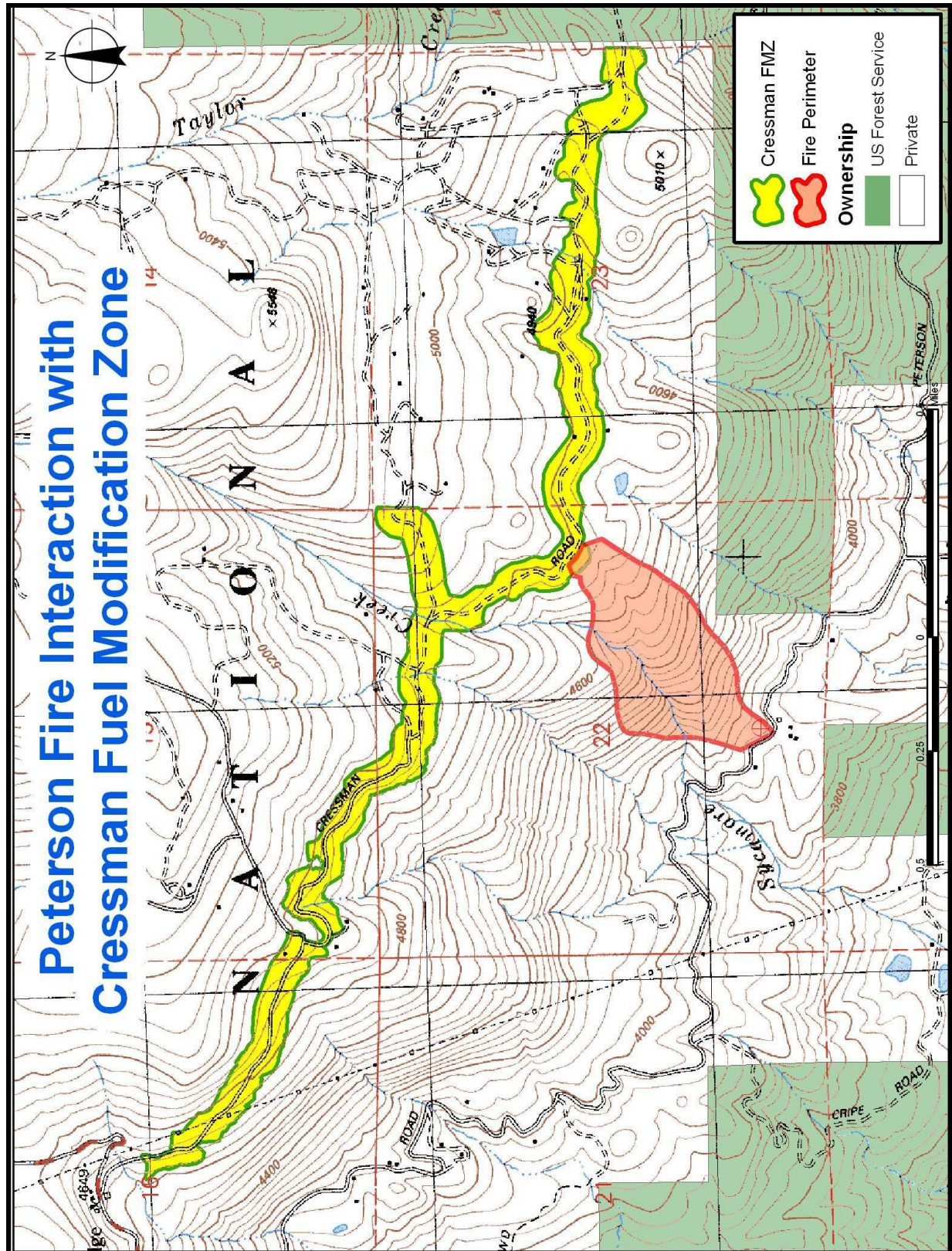
The Cressman Road FMZ has now been tested and was a success. The project was designed to provide safe ingress of fire suppression personnel and equipment while allowing for the safe egress of residents. The project was not designed to stop a fast moving high intensity fire but to provide for the opportunity to stop a low to moderate intensity fire. Many have asked if the Cressman Road FMZ stopped the Peterson Fire. The answer is that it did exactly what it was designed to do and that is allow for the opportunity to stop the fire by providing a relatively safe

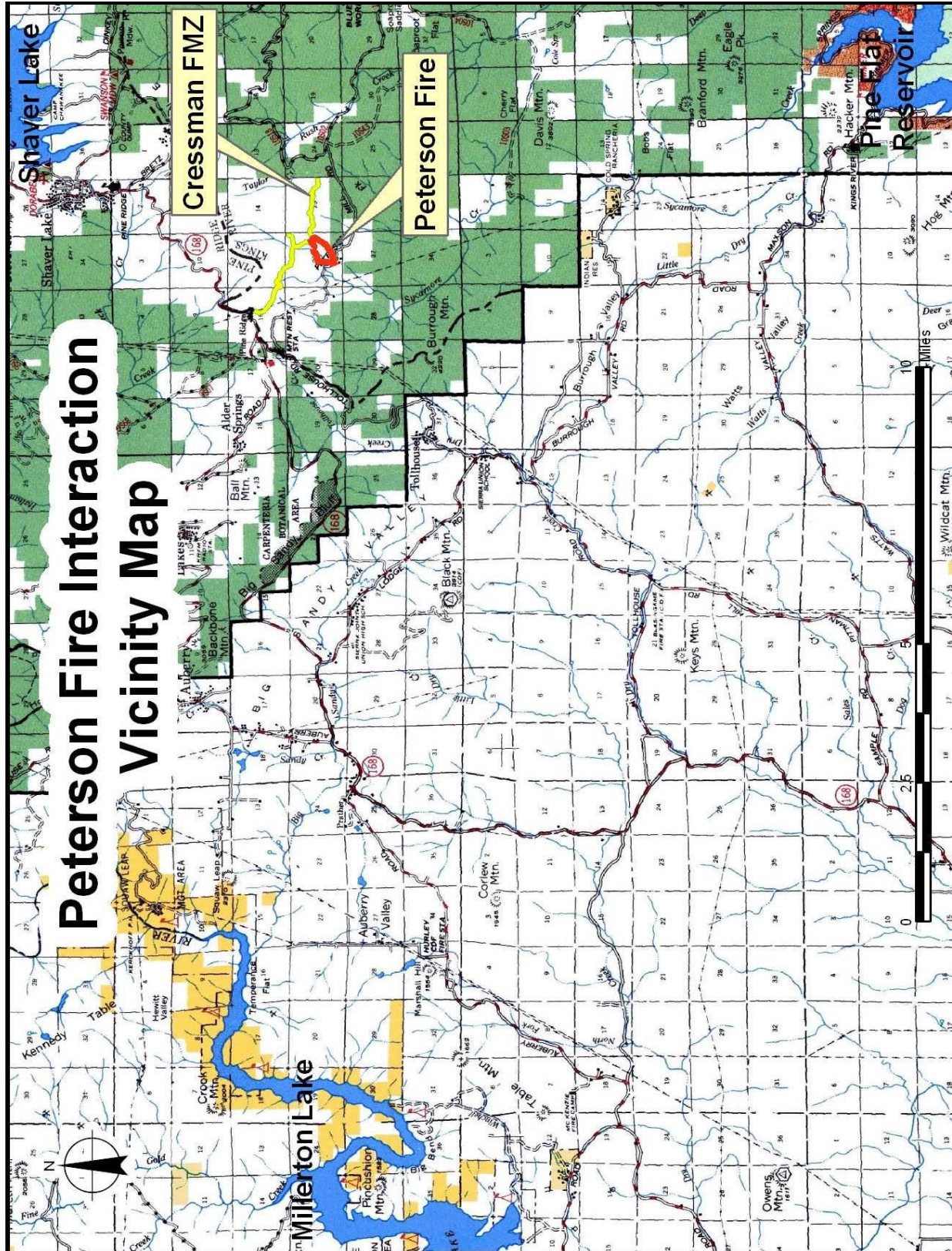
area to work from. The Cressman Road FMZ did not stop the Peterson Fire by itself, but became a tool that the Incident Commander was able to utilize to help stop the fire.

Questions and/or Further Information

For further information on the Peterson Incident, the Cressman FMZ Project or to clarify information, please contact:

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Fire Area looking North



Unburned fuels next to fire line



Burned fuels next to fire perimeter



Burned fuels next to fire perimeter





Untreated fuels (torched trees) in foreground. FMZ in background. Divided by visible dirt road.



Example of burned ladder fuels in untreated area.



Scorch height in FMZ. No trees torched in FMZ



Scorch height in untreated area. Many trees torched in untreated area, a contributing factor to over 20 spot fires at the head of the fire.



Before FMZ treatment



After FMZ treatment



Before FMZ treatment



After FMZ treatment



Before FMZ treatment



After FMZ treatment



Before FMZ treatment



After FMZ treatment